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ABSTRACT

The paper reviews issues in evaluating the manual communications skills of pre-college hearing impaired students, including testing of visual discrimination and visual memory, simultaneous communication, and attention span. (CL)

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First Friday

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Research Seminar

A Discussion of Assessment Needs in Manual Communication for Pre-College Students

Dennis R. Cokely

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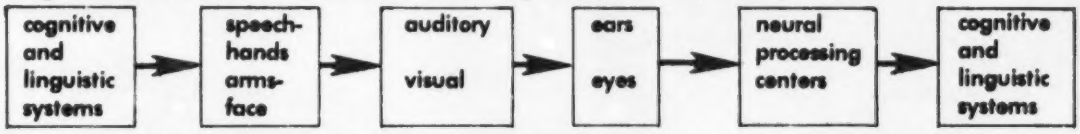
A Discussion of Assessment Needs in
Manual Communication for Pre-College Students

What I would like to do this afternoon is to talk about a few issues in evaluating the manual communications skills of pre-college students. We can start by looking at a very simple communication model. This is a model that was proposed by Sanders in 1971.

Encoding ➤ Transmitters ➤ Channels ➤ Reception ➤ Decoding ➤ Interpretation

Basically, it is a process of encoding, transmitting through a specified channel, receiving, decoding, and then understanding or interpreting. Nothing very difficult about that.

We could add other avenues and vehicles of communication to this model, but for our purposes I think we can limit the channels, for example, to auditory and visual; the transmitter to speech, hands, arms, face.



As we take this one step further and try to see how manual communication fits this model, we will look at Manually Coded English. I will use that term to mean anything that is not American Sign Language so that we can avoid talking about specific systems that have been designed to represent English. Whatever specific system is used or advocated, we can use the generic term, "Manually Coded English." We need to talk about the use of hands, arms, and the face, as well as the fact that we are dealing with a visual channel.

For the moment I want to put off talking about simultaneous communication because I think there are some factors that we may have overlooked all along that are crucial when we talk about trying to encode communication in two channels at the same time. So we will talk about the eyes and visual discrim-

ination, perception, and memory for manual communication.

Let us begin by discussing what may be a parallel type of testing to audiological testing. I am not sure how often we provide ophthalmalogical evaluations for our students, but it seems to me that is something that can be or should be done to make sure that the channel or reception is intact. Very often we assume that a student's eyes are all right. We do not make that assumption, necessarily, about hearing.

It seems to me that visual discrimination is another kind of testing that we have overlooked. If a student is having difficulty in print or with reading, we may refer him or her to a psychologist or diagnostician to be tested. But for the most part, the visual discrimination tests that are given use colors, blocks, numbers, letters, pictures--things that do not move, things that are static. But signs move. There may be quite a different level of visual discrimination that takes place. For example, one student with whom I worked had what may be a more common problem. I would write the word ABOVE, and then the word BELOW, on the blackboard and ask the student to sign one of the words. Then I would ask him to sign the other word. I would erase the two words and ask him to copy me. I signed ABOVE and he signed BELOW; I then signed BELOW and he signed ABOVE--a complete reversal. We know that students have reversal problems with printed words; for example, SAW becomes WAS. Perhaps there is such a problem with signs as well. We cannot assume there is not.

Visual memory is another factor. We do not know what an ideal memory span for manual communication is. People talk about auditory memory being a function of 7 $\pm$ 2, which is a span of five to nine items. We do not know an ideal or even a targeted span for manual communication. People have assumed that they are the same, but I am not sure about that. Some past research work

seems to indicate that memory for manual communication may be 6 $\pm$ 2.

How do we test or evaluate those factors? We must be careful that we are not evaluating for memory when we should be looking for discrimination or vice versa. With the sophisticated videotape equipment the Model Secondary School for the Deaf and Kendall Demonstration Elementary School possess, I see no reason why some very specific tests cannot be designed that will provide us with that information. For example, the use of split screen on videotape, or the use of an exact presentation of the same stimulus (by dubbing videotapes) so we do not have to request that a person sign something twice. We simply need to utilize these existing resources.

There is another area where I think there are many misunderstandings or assumptions that are not justified. This probably occurs most with hearing people who attempt to be simultaneous in their communication. We know from several sources that the average speaking rate runs between 120 to 125 words per minute. Most hearing people who learn manual communication attempt to sign as fast as they speak and to increase their rate of signing. But we do not know what the optimal rate of reception is. Even if one could sign at 125 signs per minute with perfect "clarity," we still do not know if students can comfortably understand at that rate. Hearing students can understand English at that rate, but the ear is a nerve, and the eyes are influenced by muscles. We do not know that visual processing works in exactly the same way as auditory processing.

Some preliminary studies I have done indicate that primary-aged children, at their own preference, want to receive signs at 85 signs per minute; elementary-aged students at 90 to 95 signs per minute; and junior high school students at 100 to 105 signs per minute. Perhaps there is some developmental process that is involved in selecting those rates of reception. But perhaps the nature

of the communication mode is such that there are different constraints than there are with spoken English. If this is true, it is not necessarily less effective, but simply different.

One of the other basic areas of evaluation or diagnosis is attention span. I once very crudely timed some of the younger students with whom I was working. Their average attention span before they completely broke eye contact and looked away was 4.5 seconds. There is not much one can communicate in 4.5 seconds when he or she is trying to teach higher math or geometry. I am not sure that any of us has ever systematically tried to develop increased attention spans in students. We do tell students, "pay attention, pay attention." Maybe if we tried to work on this factor as a very crucial skill in itself, we might have better results.

We do not know what happens when we ask students to receive communication by way of two modes at the same time. We do not know if any interference occurs when a student sees something represented manually and hears auditorially what is supposed to be the same thing. Three or four years ago, I designed a very simple task. The students had several objects placed on a table in front of them. I made sure that the students could give me some vocalization, a sign, and a spelling for each of those objects. On a color videotape monitor, I presented the students with a set of directions. "Put the _____ on the _____." That same sentence was given in every possible combination of modes: signs alone, signs and voice, signs and lip movement, voice alone, lip movement alone, fingerspelling, fingerspelling and voice, fingerspelling and lip movement. I found that approximately 20% of the students form each group I tested scored 100% on the task with signs alone and 100% on the task with voice alone. But with signs and voice together, their scores dropped to 50% or 60%. Up to now, we have assumed that "more is better." But I am not so sure. It bears

some research.

We need to look at student competencies with Manually Coded English and American Sign Language. All of the things that I have discussed are not necessarily language specific. These points are crucial whether or not one is talking about a manual code for English or American Sign Language, because they are part of the mode of communication itself - a manual/visual mode of communication. But there is a point where one has to begin to look at the specific linguistic characteristics of what students are doing. And that means both Manually Coded English and American Sign Language.

I do not think we can assume because students are signing something that is not English, it is, by default, American Sign Language. This is especially true at a school where there are not many deaf children of deaf parents. For many years most of the pressure on teachers has been away from American Sign Language and toward some manual code for English. Given those pressures, where can the students learn American Sign Language? They obviously do, and in the case of elementary and junior high school students, they acquire a systematic form of communication that apparently has some definite rules. But whether those rules are the same as the rules of American Sign Language, we do not know. There are some similarities but there also are some differences.

We need to look at the expressive side of students' manual communication skills. Consider something very simple like imitation. We assume that any child who can walk can imitate signs--"Any child who is born deaf can sign." The work that Marina McIntyre has done with stages of acquiring handshapes, for example, might be appropriate on the pre-college level and perhaps in working with adults. If there are some definite stages in the acquisition of handshapes which are conditioned by muscular development and other physiological factors, perhaps we need to think of those stages in the instruction of adults,

in the instruction of students who transfer from other schools, and in the instruction of students at the pre-school level. Those stages tell us, for example, that you cannot expect a very young child to sign YELLOW (with a Y handshape) before he or she physically can do it. A child must sign YELLOW (with an open, spread hand) because that's the best that that the child can do. I think there are the same kinds of systematic substitutions with older students as adults who are just learning manual communication.

We need to do much more with communicative assessment--not as we have done it traditionally (mostly vocabulary), but by looking at some student-to-student interaction. Some of the work that King Jordon has done is really quite interesting. I would like to see that work taken even further, because I believe it can provide us with an instant example of how well two students can adapt and adjust to one another. If used and set up appropriately, those kinds of referential situations where two students are involved in a specific task, could provide us with some excellent measures of students' manual communication skills. It may be important to know how well a student can sign in front of a TV camera or in front of an adult. Realistically, what is most important is how well he or she is going to get along with his or her peers.

I have experimented with tinker toys with students at Kendall School. I built a model and gave one student all the leftover pieces of the tinker toy kit. I would then give another student the model and tell him or her to explain how to build that model to the other student. That example is a microcosm of a true communication situation, one where there must be a mutual exchange. One gets a feeling for how well the first student (the "builder") can handle frustrating situations, and how those two students might clear up misunderstandings. One also gets a feeling for how the second student (the "director") begins to structure his or her communication. This is interesting

because most students with whom I have tried this explain the model from the ground up; most of the adults with whom I have tried it explain the model from the top down or from the left to the right. The adults rarely start from the ground up. If this information were put on videotape, these situations would be invaluable in helping us to place and program student experiences in school.

Another thing that should be done at all schools that will prove to be quite successful and valuable, is the annual collection of videotaped sign samples from students. We do it with speech and audiology evaluations and those skills are important. But for most of the students, 95% to 99% of their day is spent signing. We should be collecting samples on an annual basis to measure growth, to measure change, to provide feedback to classroom teachers. But in doing this, we have to ask ourselves how we collect some of that data.

Specifically, about four years ago, I did another very crude study with Kendall School's graduating class. I split the group in half, matched as best I could, then I split each group in half so that there were four groups. With two of the groups, I showed some pictures in a sequence. It was a story about a boy running away from home because he had a clash with his father. The story built up to a climax and then came to a point where the students had to finish the story themselves. I asked one group to write paragraphs for me. I asked the other group to sign the story. With the other groups, I showed a film of a boy running away from home because he had a clash with his father. Again, I did the same thing. One group was asked to write, the other group was asked to sign. Then I switched groups. The groups that had written, signed, and the groups that had signed, wrote. About a month to a month-and-a-half later, I switched the stimulus material so all groups worked with the pictures and with the film. And in all cases, when film was used I got better results. Better results are defined as much more quantity and fewer errors in the stu-

dents' writing and a larger quantity and fewer indications of discomfort with signed material.

Many times teachers think they collect "language" samples but they are really English samples. They are not really language samples because to collect language samples of students we need to look at signing, at speech, and at writing. We need to examine all manifestations of linguistic behavior, not just one facet. Often what happens is that we present students with a fixed or static stimulus while all day long the students are dealing with moving stimuli. I noticed, for example, that when I presented the pictures I received a great deal of past tense use in the students' writing. But when presented with film, there was much more variation than with the "frozen" pictures, e.g. "The boy walked home. The boy will run away. The father will chase him."

Another area that we need to look at is the effect of simultaneity. I mentioned some students (approximately 20%) could function quite well with one or the other mode of communication, but not as well when modes are combined. Again, that reflects the idea that more is better. We do not know what happens in the brain when a student hears and sees something at the same time. We do know that rarely, if ever, does one talk about true simultaneous communication, because there is always a lag in the production of one component or the other. And because of that lag, there may be some problems in processing information. We need to assess how to assist students in being simultaneous, if indeed it is determined that is the direction to take. We very often assume that the students can do it. "Well, they can sign and all I have to do is ask them to use their voice." How many of you are truly comfortable signing and talking at the same time? It is not something that is very easy. We know that we would prefer to talk or sign. It's not something that we should assume the

students can do on their own.

In closing, I would like to say that we can no longer afford to assume as much as we have with regard to the signing skills of our students. We have invested a great deal of time, money, manpower, and resources exploring communication strategies which we know are problematic for our students - speech and audition. That is fine and I do not mean to belittle efforts in those areas. However, it seems to me that we should begin to critically examine and assess the manual communication of our students, if for no other reason than the fact that the students rely on it for successful interaction wtih peers and adults.

Instead of focusing so much attention on what we know are problem areas, we should also begin to attend to those areas in which the students have some degree of success. We should begin to question some assumptions we have made regarding manual communication; we should begin to apply the rigors of scientific assessment to manual communication needs of our students. In so doing, I would like to change the adage, "Take 'em where they're at" to "Take 'em where they're at - but let's find out where that is first."